ABSTRACT

The present invention relates to a method for manufacturing a micro needle array with an X-ray process. The present invention provides a method for manufacturing a micro needle array, comprising the steps of preparing an X-ray mask by forming an absorber having a configuration of the micro needle array on a substrate; preparing a PMMA cast for the micro needle array by exposing PMMA to vertical and inclined X-rays using the X-ray mask; preparing a flexible PDMS mold having a configuration opposite to that of the PMMA cast by pouring PDMS on the PMMA cast; filling an upper surface of the PDMS mold with a gel type of polymer to obtain a desired thickness of the polymer; patterning a desired configuration of a hole by irradiating UV rays on the polymer; and separating the PDMS mold to complete the polymer micro needle array. The micro needle array of the present invention is made of a polymer material and can be used for drawing blood from or injecting a medicine into the skin.

5

10

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 29 July 2004 (29.07.2004)

PCT

(10) International Publication Number WO 2004/062899 A3

(51) International Patent Classification7:

B29D 31/00

(21) International Application Number:

PCT/KR2004/000074

(22) International Filing Date: 16 January 2004 (16.01.2004)

(25) Filing Language:

Korean

(26) Publication Language:

English

(30) Priority Data:

10-2003-0003041 16 January 2003 (16.01.2003)

(71) Applicant and

(72) Inventor: LEE, Seung-seob [KR/KR]; 2-401, Kaist APT, 383-2, Doryong-dong, Yousung-gu, Daejeon 305-340 (KR).

(72) Inventor; and

(75) Inventor/Applicant (for US only): MOON, Sang-Joon [KR/KR]; 2-11202, Daehagwon APT, 756, Jigok-dong, Nam-gu, Pohang-si 790-390 (KR).

(74) Agent: LIM, Young-Hee; Sinmyung Bldg 3rd Fl., 645-21, Yoksam-Dong, Kangnam-Gu, Seoul 135-080 (KR).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

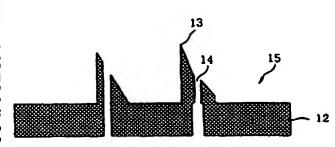
Published:

- with international search report

(88) Date of publication of the international search report: 7 October 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD FOR MANUFACTURING OF POLYMER MICRO NEEDLE ARRAY WITH LIGA PROCESS



(57) Abstract: The present invention relates to a method for manufacturing a micro needle array with an X-ray process. The present invention provides a method for manufacturing a micro needle array, comprising the steps of preparing an X-ray mask by forming an absorber having a configuration of the micro needle array on a substrate; preparing a PMMA cast for the micro needle array by exposing PMMA to vertical an inclined X-rays using the X-ray mask; preparing a flexible PDMS mold having a configuration opposite to that of the PMMA cast by pouring PDMS on the PMMA cast; filling an

upper surface of the PDMS mold with a gel type of polymer to obtain a desired thickness of the polymer; patterning a desired configuration of a hole by irradiating UV rays on the polymer; and separating the PDMS mold to complete the polymer micro needle array. The micro needle array of the present invention is made of a polymer material and can be used for drawing blood from or injecting a medicine into the skin.